Trend Study 19B-7-07

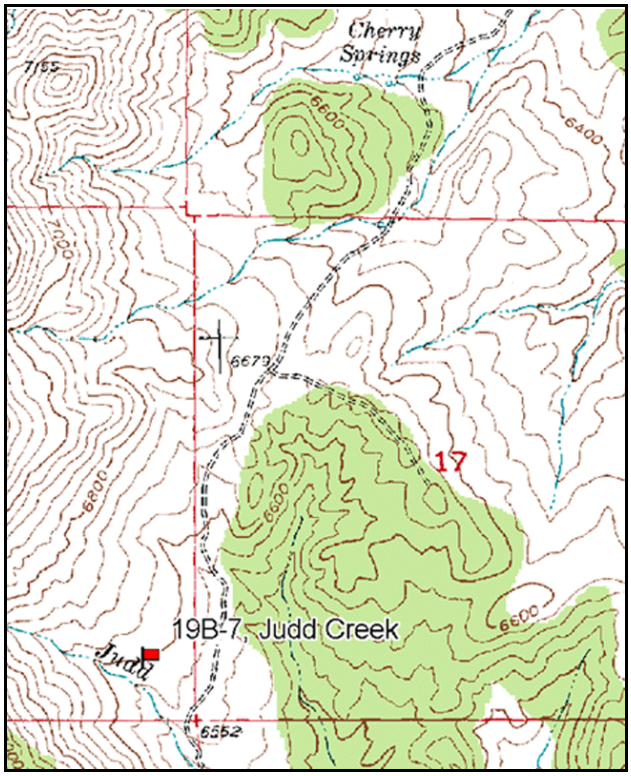
Study site name: Judd Creek . Vegetation type: Mountain Brush .

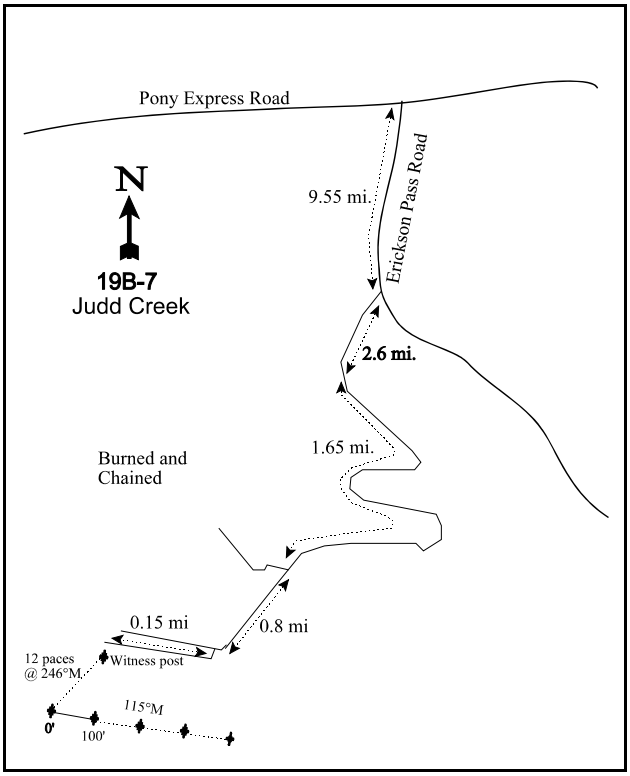
Compass bearing: frequency baseline 115 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Starting at the intersection of the Pony Express and Erickson Pass Roads, proceed south the on Erickson Pass Road for 9.55 miles to an intersection just before where the road crosses Government Creek. Turn right (i.e., southwest) at the intersection and proceed 2.5 miles to an intersection. Stay to the right (i.e., southerly) and proceed 1.9 miles to a green steel "T" fencepost on the west side of the road (next to a Rhus trilobata). From the fencepost, the 0-foot stake of the baseline is 12 paces away at an azimuth of 246 degrees magnetic. The baseline runs at 115 degrees magnetic. The study is marked by green steel "T" fenceposts approximately 12 to 18 inches in height.





Map Name: Indian Springs

Diagrammatic Sketch

Township 10S , Range 7W , Section 18

GPS: NAD 83, UTM 12S 357317 E 4423422 N

DISCUSSION

Judd Creek - Trend Study No. 19B-7

Study Information

This study is located within a small parcel of private property surrounded by Bureau of Land Management land. The area is categorized as deer winter range, and has been used by cattle during the spring, summer, and fall [elevation: 6,600 feet (2,012 m), slope: 10%, aspect: south]. Portions of the site were burned in 1996 and apparently seeded. Lines 2 and 3 of the baseline sample an area that was not burned and the remaining lines are within burned areas. Judd Creek, an intermittent stream, is found 200 feet (61 m) south of the baseline. It has a willow community associated with it. Wildlife use is light, while livestock use is moderate. From the pellet group tansect, there were an estimated 9 deer days use/acre (23 ddu/ha) in 2002, and 21 deer days use/acre (53 ddu/ha) in 2007. Elk use was estimated at 3 days use/acre (7 edu/ha) in 2007. There were an estimated 49 cattle days use/acre (120 cdu/ha) in 2002 and 56 cattle days use/acre (138 cdu/ha) in 2007. In 2007, all pellets and pats appeared to be from spring and summer. In 2007, salt licks were found within the area. The proximity of Judd Creek, the presence of the salt licks, and heavily grazed grasses suggest that the study is located in an area of high grazing pressure.

Soil

The study lies within the Abela soil series, which generally consists of very deep, well-drained soils that formed in alluvium or lacustrine deposits. Soils in this series are derived mainly from limestone, sandstone, and quartzite, and are found on fan remnants and lake terraces with 2%-25% slopes (USDA-NRCS 2007). Specifically at the study, the soil has a clay loam texture and is neutral in reactivity (pH of 6.7). The soil is rocky and very shallow. Additionally, there has been high soil disturbance beneath the few Utah juniper (*Juniperus osteosperma*) trees that are clustered along the baseline. Litter cover prior to the fire was high at approximately 60% in 1983 and 1989, but has averaged 28% since the fire. In 2002, relative bare ground cover was high (34%) and the erosion condition was classified as moderate. It improved to stable in 2007 due to decreases in pedestalling, rills, and soil and litter movement. Relative bare ground cover in 2007 was also lower (20%) in 2007.

Browse

The key browse species that are present include: Utah serviceberry (*Amelanchier utahensis*), Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*) and antelope bitterbrush (*Purshia tridentata*), most of which are found in the unburned portion of the transect. Canopy cover of sagebrush was 1% in 2002 and 2% in 2007. Prior to the fire, the estimated density for sagebrush was 1,466 plants/acre (3,629 plants/ha). The density decreased to 340 plants/acre (842 plants/ha) in 1997, and was stable at 260 plants/acre (644 plants/ha) in 2002 and 2007. Reproduction and recruitment have been low in all sample years. Decadence has been high; greater than 20% of the population has been decadent in all sample years, and greater than 60% in 1989 and 2002. In 1997 and 2002, the density of dead plants was almost as high as the density of living plants. The proportion of plants exhibiting poor vigor has been widely variable and has ranged from 3%-86%. The proportion was highest in 1989 (86%) and 2002 (54%), which coincides to drought periods (Utah Climate Summaries 2007). Additionally, 12% of the population was classified as dying in 1997, 54% in 2002, and 23% in 2007. Sagebrush annual leader growth averaged 2.2 inches (5.6 cm) in 2002 and 1.4 inches (3.6 cm) in 2007. Browse use was light-moderate in 1983 and 1989, and has been light since 1997.

The canopy cover of antelope bitterbrush increased from 2% in 2002 to 4% in 2007. Bitterbrush density increased from 766 plants/acre (1,896 plants/ha) in 1983 to 2,166 plants/acre (5,361 plants/ha) in 1989. Following the wildfire, the density has been fairly stable at approximately 380 plants/acre (940 plants/ha). The population has been comprised mostly of mature plants. Seedling bitterbrush have not been sampled in any year. The density of young plants peaked in 1989 at 200 plants/acre (495 plants/ha) and decreased to 0 plants/acre in 2007. Decadent plants have accounted for 0% to 28% of the population. Bitterbrush plants

exhibiting poor vigor have been a small proportion of the population in all sample years. The average annual leader growth was 3.9 inches (9.9 cm) in 2002 and decreased to 2.4 inches (6.1 cm) in 2007. Browse use has ranged from light to heavy.

A few Utah serviceberry plants are also scattered throughout the site. Canopy cover was less than 1% in 2002 and 2007, and the density has been approximately 60 plants/acre (149 plants/ha) since 1989. Serviceberry has had moderate-heavy use, with one-third of the population classified with poor vigor since 1997.

Less preferred and/or palatable browse species sampled include: Oregon grape (*Mahonia repens*), stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), broom snakeweed (*Gutierrezia sarothrae*), Woods' rose (*Rosa woodsii*), pricklypear cactus (*Opuntia* sp.), and mountain snowberry (*Symphoricarpos oreophilus*). With the exception of broom snakeweed, these species occur in relatively low densities. The snakeweed density has ranged from 1,160 plants/acre (2,871 plants/ha) in 1997 to 7,232 plants/acre (17,900 plants/ha) in 1989. There were an estimated 1,300 plants/acre (3,218 plants/ha) in 2007. Juniper tree density has been too low to use the point-centered quarter method. However, juniper canopy cover increased from 4% in 2002 to 6% in 2007.

Herbaceous Understory

Perennial grass cover increased from 6% in 1997 to 17% in 2007. The number of grass species that have been sampled since 1983 has ranged from five to 13. The dominant perennial grasses include crested wheatgrass (*Agropyron cristatum*), bluebunch wheatgrass (*Agropyron spicatum*), and to a lesser extent, mutton bluegrass (*Poa fendleriana*), and Sandberg bluegrass (*Poa secunda*). Two less desirable species, cheatgrass (*Bromus tectorum*) and bulbous bluegrass (*Poa bulbosa*) have been sampled. Cheatgrass cover was 3% in 1997 and less than 1% in 2007. Although bulbous bluegrass is a perennial, it has a phenology that is similar to annual grasses (Stewart and Hull 1949).

Perennial forb cover decreased from 9% in 1997 to 4% in 2002, then increased to 6% in 2007. The dominant perennial species include wild onion (*Allium* sp.), bastard toadflax (*Comandra pallida*), stoneseed (*Lithospermum ruderale*), longleaf phlox (*Phlox longifolia*), and American vetch (*Vicia americana*). When it was sampled in 1997 and 2007, pale alyssum (*Alyssum alyssoides*) was the dominant forb species. The forb component has been diverse, and the number of species has ranged from 17 to 38. Diversity was highest in 1997 when precipitation was above normal, and lowest in 2002 during a region-wide drought. No annual forbs were sampled in 2002.

1989 TREND ASSESSMENT

The browse trend is up. The density of Wyoming big sagebrush and antelope bitterbrush increased 16% and 183%, respectively. The increase in density was given more weight than other parameters when determining trend. For example, the increase in density offset the increase in sagebrush decadence (from 21% to 61%) and the number of plants exhibiting poor vigor (86%). Bitterbrush decadence increased from 0% to 28%. The increase in decadence and poor vigor were attributed to drought conditions. The grass trend is up. The sum of nested frequency of perennial grasses increased 61%. There were significant increases in the nested frequencies of mutton bluegrass and Sandberg bluegrass. The forb trend is stable. The sum of nested frequency of perennial forbs decreased 4%. The nested frequencies of wild onion and pale stickseed (*Hackelia patens*) decreased significantly, but those of longleaf phlox and tapertip hawksbeard (*Crepis acuminata*) increased significantly.

browse - up (+2) grass - up (+2) forb - stable (0)

1997 TREND ASSESSMENT

The browse trend is down. The 1996 fire greatly reduced the density of Wyoming big sagebrush and antelope bitterbrush. Sagebrush does not re-sprout after a fire, and bitterbrush re-sprouting success following fire is

variable. Sagebrush density decreased 77% and bitterbrush density decreased 83%. The density of dead sagebrush was nearly as high as the density of the live population. Sagebrush decadence decreased from 61% to 29%, and plants with poor vigor decreased to 18% of the population. Bitterbrush decadency decreased from 28% to 11%. Browse use on sagebrush shifted from light-moderate to light, and use shifted on bitterbrush from moderate-heavy to light. Increaser or invader species, primarily broom snakeweed, low rabbitbrush, and Woods' rose, were in low abundance but could increase under favorable climatic conditions. The grass trend is down. The sum of nested frequency of perennial grasses decreased 26%. Indian ricegrass (*Oryzopsis hymenoides*) and mutton bluegrass decreased significantly in nested frequency. Cheatgrass cover was second only to bluebunch wheatgrass. The forb trend is slightly down. The sum of nested frequency of perennial forbs decreased 11%. Although the number of forb species increased from 21 to 38, the increase did not include species with high forage values. The Desirable Components Index (DCI) score was fair-good due to the low preferred-browse cover, high decadence, and low perennial grass cover.

winter range condition (DCI) - fair-good (45) Low potential scale
browse - down (-2) grass - down (-2) forb - slightly down (-1)

2002 TREND ASSESSMENT

The browse trend is slightly down. The density of Wyoming big sagebrush decreased 24%, but the density of antelope bitterbrush increased 17%. Sagebrush decadence increased to 69% of the population and the majority of the decadent plants were classified as dying. Furthermore, the density of dead plants remained nearly as large as live plants and plants with poor vigor comprised 54% of the population. Bitterbrush decadence increased from 11% to 14%, and plants with poor vigor accounted for an additional 14% of the population. Browse use remained light on sagebrush and shifted from light to heavy on bitterbrush. The grass trend is up. The sum of nested frequency of perennial grasses increased 21%, including a significant increase in the nested frequency of crested wheatgrass. Cheatgrass was not sampled. Grasses had been moderately to heavily utilized in 2002. The forb trend is down. The sum of nested frequency of perennial forbs decreased 70%, and the number of species decreased to 17. There were significant decreases in the nested frequencies of longleaf phlox and timber poisonvetch (*Astragalus convallarius*). The change in vegetative composition towards more grass and less forbs is attributed to the drought. The DCI score declined to fair due to the low preferred-browse cover (less than 5%).

winter range condition (DCI) - fair (42) Low potential scale
browse - slightly down (-1) grass - up (+2) forb - down (-2)

2007 TREND ASSESSMENT

The browse trend is stable. The density of Wyoming big sagebrush was constant, but antelope bitterbrush density decreased 14%. No seedlings were sampled for either species, and while young no bitterbrush were sampled, the density of young sagebrush doubled. Sagebrush decadence decreased from 69% to 23%, but all of the decadent plants were classified as dying. There were no decadent bitterbrush plants sampled. Seed production on sagebrush was good, but bitterbrush had poor seed production. Browse use remained light for sagebrush and heavy for bitterbrush. The Wood's rose population was moderately browsed. The grass trend is up. The sum of nested frequency of perennial grasses increased 60%, including significant increases in the nested frequencies of bluebunch wheatgrass and Sandberg bluegrass. Cheatgrass was sampled again, though at a lower frequency than in 1997. All wheatgrass species were moderately to heavily grazed. The forb trend is up. The sum of nested frequency of perennial forbs increased more than two-fold, and the number of species increased to 30. Perennial forb richness was higher than pre-fire levels, but abundance of each species was lower. Stoneseed plants had been heavily grazed. The DCI score improved to good-excellent due to the increases in preferred-browse and perennial grass cover.

winter range condition (DCI) - good-excellent (65) Low potential scale
browse - stable (0) grass - up (+2) forb - up (+2)

HERBACEOUS TRENDS --
Management unit 19B, Study no: 7

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
G	Agropyron cristatum	-	-	a1	b131	b108	.15	4.61	5.82
G	Agropyron intermedium	-	-	a7	ab13	b19	.09	.12	.50
G	Agropyron smithii	-	-	a3	a4	a1	.03	.03	.15
G	Agropyron spicatum	a59	a72	a85	a73	b144	3.92	2.80	7.30
G	Bromus tectorum (a)	-	-	b186	-	a36	3.39	-	.32
G	Melica bulbosa	-	-	2	-	-	.00	-	-
G	Oryzopsis hymenoides	b62	b62	a19	a8	a17	.12	.09	.45
G	Phleum pratense	-	-	1	-	-	.00	-	-
G	Poa bulbosa	-	-	-	-	20	-	-	.29
G	Poa fendleriana	b38	c95	a13	a3	ab25	.28	.03	1.00
G	Poa pratensis	-	-	a19	a10	a12	.16	.04	.37
G	Poa secunda	a12	b47	b57	a13	b63	.98	.08	1.14
G	Sitanion hystrix	a6	a9	a1	-	-	.00	-	-
G	Stipa lettermani	-	-	2	-	-	.03	-	-
Total for Annual Grasses		0	0	186	0	36	3.39	0	0.31
Total for Perennial Grasses		177	285	210	255	409	5.79	7.83	17.05
Total for Grasses		177	285	396	255	445	9.18	7.83	17.37
F	Agoseris glauca	ab14	-	a3	-	b24	.06	-	.25
F	Alyssum alyssoides (a)	-	-	a189	-	b236	3.73	-	3.83
F	Allium sp.	b122	a28	b105	-	a18	1.12	-	.06
F	Antennaria rosea	-	-	3	-	-	.15	-	-
F	Arabis sp.	-	a4	-	-	a1	-	-	.00
F	Artemisia ludoviciana	b32	b23	a3	ab19	ab20	.30	.37	.81
F	Aster chilensis	b50	b52	-	a2	-	-	.03	-
F	Astragalus convallarius	ab5	ab6	b15	a1	ab5	.23	.00	.02
F	Astragalus sp.	-	a3	b25	-	a1	.16	-	.01
F	Astragalus utahensis	-	2	-	-	-	-	-	-
F	Balsamorhiza sagittata	a5	a4	a9	a3	a3	.56	.15	.18
F	Castilleja linariaefolia	-	-	1	-	-	.00	-	-
F	Camelina microcarpa (a)	-	-	b21	-	a2	.63	-	.01
F	Calochortus nuttallii	a12	a8	a8	-	a8	.04	-	.02
F	Cirsium sp.	b33	ab25	a10	ab16	a5	.29	.27	.04
F	Collomia linearis (a)	-	-	a17	-	a9	.06	-	.03
F	Comandra pallida	a33	a27	ab59	b71	ab50	.99	1.39	.54

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
F	Collinsia parviflora (a)	-	-	$_{a}$47	-	$_{b}$71	.21	-	.28
F	Crepis acuminata	$_{a}$18	$_{b}$38	$_{a}$11	-	$_{a}$16	.46	-	.27
F	Cryptantha sp.	$_{a}$13	$_{a}$9	$_{a}$9	$_{a}$20	$_{a}$8	.07	.14	.07
F	Delphinium nuttallianum	2	-	-	-	-	-	-	-
F	Descurainia sp. (a)	-	-	$_{a}$3	-	$_{a}$6	.18	-	.02
F	Epilobium brachycarpum (a)	-	-	-	-	6	-	-	.10
F	Eriogonum brevicaule	-	-	-	1	-	-	.00	-
F	Erodium cicutarium (a)	-	-	1	-	-	.00	-	-
F	Erigeron sp.	-	-	$_{a}$3	$_{a}$2	-	.03	.00	-
F	Eriogonum racemosum	-	-	$_{a}$3	-	$_{a}$1	.00	-	.03
F	Galium boreale	-	-	5	-	-	.18	-	-
F	Gayophytum ramosissimum(a)	-	-	-	-	1	-	-	.00
F	Hackelia patens	$_{c}$61	$_{b}$22	$_{a}$5	$_{a}$3	$_{a}$4	.01	.04	.03
F	Lathyrus brachycalyx	-	-	25	-	-	.37	-	-
F	Lactuca serriola	-	-	-	$_{a}$4	$_{b}$23	-	.03	.12
F	Linum lewisii	$_{b}$13	-	$_{a}$3	-	-	.01	-	-
F	Lithospermum ruderale	$_{a}$17	$_{a}$30	$_{a}$16	$_{a}$18	$_{a}$12	1.32	1.35	.63
F	Lomatium grayi	$_{a}$4	$_{a}$5	$_{a}$11	-	$_{a}$3	.05	-	.16
F	Microsteris gracilis (a)	-	-	$_{a}$26	-	$_{a}$22	.08	-	.05
F	Monolepis nuttalliana (a)	3	-	-	-	-	-	-	-
F	Oenothera sp.	1	-	-	-	-	-	-	-
F	Penstemon sp.	-	$_{a}$3	-	$_{a}$1	-	-	.00	-
F	Petradoria pumila	-	$_{a}$2	$_{a}$8	$_{a}$8	$_{a}$5	.24	.24	.33
F	Phlox hoodii	-	-	-	1	-	-	.00	-
F	Phlox longifolia	$_{b}$54	$_{c}$172	$_{c}$167	$_{a}$1	$_{c}$175	1.27	.00	2.50
F	Polygonum douglasii (a)	-	-	$_{b}$14	$_{a}$3	-	.18	.00	-
F	Ranunculus testiculatus (a)	-	-	$_{a}$36	-	$_{a}$20	.51	-	.09
F	Taraxacum officinale	-	-	7	-	-	.05	-	-
F	Tragopogon dubius	$_{a}$21	-	$_{a}$19	-	-	.47	-	-
F	Trifolium sp.	-	-	1	-	-	.00	-	-
F	Unknown forb-perennial	-	1	-	-	-	-	-	-
F	Veronica biloba (a)	-	-	$_{b}$54	-	$_{a}$15	.21	-	.06
F	Vicia americana	$_{b}$168	$_{b}$188	$_{a}$43	-	$_{a}$32	.59	-	.11
F	Viguiera multiflora	-	-	1	-	-	.00	-	-
Total for Annual Forbs		3	0	408	3	388	5.82	0.00	4.48
Total for Perennial Forbs		678	652	578	171	414	9.09	4.07	6.24

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
Total for Forbs		681	652	986	174	802	14.92	4.07	10.72

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 19B, Study no: 7

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	Amelanchier utahensis	3	3	3	.63	.38	.38
B	Artemisia tridentata wyomingensis	10	9	9	3.13	1.91	2.15
B	Cercocarpus montanus	1	0	0	-	-	-
B	Chrysothamnus nauseosus albicaulis	0	6	0	-	.30	-
B	Chrysothamnus viscidiflorus viscidiflorus	5	12	15	.18	.78	.51
B	Gutierrezia sarothrae	16	30	29	.19	.82	.84
B	Juniperus osteosperma	2	5	4	2.92	4.84	1.61
B	Mahonia repens	20	9	16	.41	.07	.07
B	Opuntia sp.	9	10	6	.33	.68	.03
B	Purshia tridentata	13	14	13	2.36	2.50	3.17
B	Rosa woodsii	9	11	11	.26	.42	.72
B	Symphoricarpos oreophilus	3	1	0	.15	.00	-
B	Tetradymia canescens	5	6	5	.03	.04	.16
Total for Browse		96	116	111	10.61	12.78	9.65

CANOPY COVER, LINE INTERCEPT --
Management unit 19B, Study no: 7

Species	Percent Cover		
	'97	'02	'07
Amelanchier utahensis	-	.48	.33
Artemisia tridentata wyomingensis	-	.71	2.36
Chrysothamnus nauseosus albicaulis	-	.05	-
Chrysothamnus viscidiflorus viscidiflorus	-	.83	.66
Gutierrezia sarothrae	-	.76	1.20
Juniperus osteosperma	1.79	3.59	6.44
Mahonia repens	-	-	.08
Opuntia sp.	-	.38	.23
Purshia tridentata	-	1.64	3.83
Rosa woodsii	-	.30	.48
Tetradymia canescens	-	.66	.23

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 19B, Study no: 7

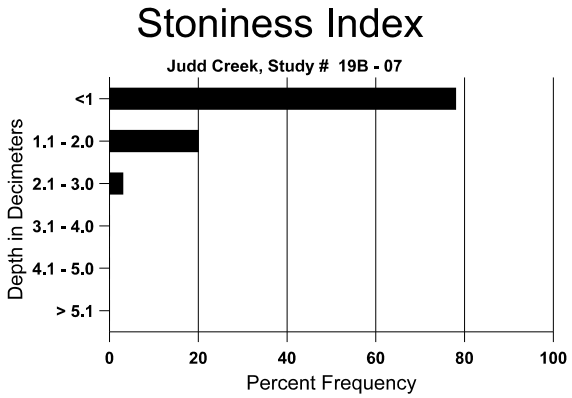
Species	Average leader growth (in)	
	'02	'07
Artemisia tridentata wyomingensis	2.2	1.4
Purshia tridentata	3.9	2.4

BASIC COVER --
Management unit 19B, Study no: 7

Cover Type	Average Cover %				
	'83	'89	'97	'02	'07
Vegetation	2.25	4.75	34.89	26.16	36.63
Rock	12.50	8.50	8.64	10.54	7.15
Pavement	7.00	9.50	14.81	9.06	10.11
Litter	59.00	60.75	28.76	26.81	34.71
Cryptogams	0	0	.87	.00	0
Bare Ground	19.25	16.50	15.31	37.90	22.27

SOIL ANALYSIS DATA --
Herd Unit 19B, Study no: 7, Judd Creek

Effective rooting depth (in)	Temp °F (depth)	pH	Clay loam			%0M	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
9.1	66.8 (11.9)	6.7	40.4	25.1	34.6	4.9	27.5	611.2	.8



PELLET GROUP DATA --
Management unit 19B, Study no: 7

Type	Quadrat Frequency		
	'97	'02	'07
Rabbit	5	3	3
Elk	-	-	-
Deer	11	10	3
Cattle	5	15	13

Days use per acre (ha)	
'02	'07
-	-
-	3 (7)
9 (23)	21 (53)
49 (120)	56 (138)

BROWSE CHARACTERISTICS --
Management unit 19B, Study no: 7

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
83	**33**	-	-	33	-	-	0	100	0	-	100	35/35
89	**66**	-	-	-	66	-	0	100	100	-	0	-/-
97	**60**	-	20	20	20	20	0	0	33	33	33	27/35
02	**60**	-	-	40	20	-	33	67	33	33	33	30/36
07	**60**	-	-	40	20	-	33	67	33	33	33	36/40

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis												
83	**1265**	-	66	933	266	-	58	3	21	-	3	25/29
89	**1466**	-	66	500	900	-	55	2	61	-	86	18/25
97	**340**	20	20	220	100	260	6	0	29	12	18	28/41
02	**260**	-	20	60	180	220	8	0	69	54	54	20/33
07	**260**	-	40	160	60	40	0	0	23	23	23	23/35
Cercocarpus montanus												
83	**0**	-	-	-	-	-	0	0	-	-	0	-/-
89	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**20**	-	20	-	-	20	100	0	-	-	0	-/-
02	**0**	-	-	-	-	-	0	0	-	-	0	72/74
07	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus nauseosus albicaulis												
83	**66**	-	-	-	66	-	0	0	100	-	0	-/-
89	**0**	-	-	-	-	-	0	0	0	-	0	-/-
97	**0**	-	-	-	-	-	0	0	0	-	0	-/-
02	**160**	-	-	160	-	-	0	13	0	-	13	12/16
07	**0**	-	-	-	-	-	0	0	0	-	0	22/39
Chrysothamnus viscidiflorus viscidiflorus												
83	**33**	-	-	33	-	-	0	0	0	-	0	13/28
89	**33**	-	-	33	-	-	0	0	0	-	0	11/13
97	**160**	-	-	160	-	-	0	0	0	-	0	14/19
02	**420**	-	80	300	40	40	10	5	10	-	14	11/21
07	**400**	-	-	400	-	20	10	5	0	-	0	14/24
Gutierrezia sarothrae												
83	**2333**	-	400	1933	-	-	0	0	0	-	0	9/7
89	**7232**	66	466	5900	866	-	0	0	12	-	.46	8/8
97	**1160**	220	360	780	20	-	0	0	2	-	0	9/5
02	**2000**	40	-	2000	-	40	0	0	0	-	1	11/16
07	**1300**	280	120	1160	20	20	2	3	2	2	2	9/11
Juniperus osteosperma												
83	**66**	-	33	33	-	-	0	0	-	-	0	67/79
89	**133**	33	100	33	-	-	0	0	-	-	0	138/118
97	**40**	-	20	20	-	20	0	0	-	-	0	-/-
02	**100**	20	40	60	-	-	0	0	-	-	0	-/-
07	**80**	-	60	20	-	20	0	0	-	-	0	-/-

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Mahonia repens												
83	**10966**	-	800	10166	-	-	0	0	0	-	0	4/6
89	**20099**	566	3533	16566	-	-	0	0	0	-	0	3/3
97	**1480**	340	420	1060	-	-	0	0	0	-	0	2/4
02	**420**	-	60	360	-	-	0	0	0	-	0	2/2
07	**2400**	-	-	2380	20	-	0	0	1	-	0	3/4
Opuntia sp.												
83	**133**	-	100	33	-	-	0	0	0	-	0	4/16
89	**333**	-	33	300	-	-	0	0	0	-	10	6/8
97	**280**	-	20	240	20	-	0	0	7	-	0	6/14
02	**280**	-	-	260	20	-	0	0	7	-	0	8/20
07	**140**	-	-	140	-	-	0	0	0	-	0	6/19
Purshia tridentata												
83	**766**	-	33	733	-	-	17	83	0	-	0	14/36
89	**2166**	-	200	1366	600	-	65	29	28	-	2	15/33
97	**360**	-	80	240	40	100	0	0	11	-	0	18/54
02	**420**	-	20	340	60	-	19	71	14	-	14	15/45
07	**360**	-	-	360	-	-	6	89	0	-	0	18/50
Rhus trilobata												
83	**0**	-	-	-	-	-	0	0	-	-	0	-/-
89	**0**	-	-	-	-	-	0	0	-	-	0	-/-
97	**0**	-	-	-	-	-	0	0	-	-	0	30/48
02	**0**	-	-	-	-	-	0	0	-	-	0	42/60
07	**0**	-	-	-	-	-	0	0	-	-	0	47/79
Rosa woodsii												
83	**0**	-	-	-	-	-	0	0	0	-	0	-/-
89	**0**	-	-	-	-	-	0	0	0	-	0	-/-
97	**660**	120	640	20	-	-	0	0	0	-	0	10/5
02	**2400**	-	1620	580	200	-	0	0	8	5	5	8/9
07	**1680**	-	440	1240	-	40	49	15	0	-	0	8/8
Symphoricarpos oreophilus												
83	**33**	-	-	33	-	-	0	0	0	-	0	11/18
89	**66**	-	33	33	-	-	0	0	0	-	50	13/15
97	**140**	-	60	-	80	-	0	0	57	-	0	19/32
02	**20**	-	-	-	20	-	0	0	100	100	100	-/-
07	**0**	-	-	-	-	-	0	0	0	-	0	14/25

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Tetradymia canescens												
83	**266**	-	33	133	100	-	0	0	38	-	0	5/10
89	**232**	-	66	133	33	-	14	0	14	-	43	7/10
97	**160**	-	40	120	-	-	0	0	0	-	0	10/7
02	**140**	-	-	100	40	-	0	0	29	-	29	10/21
07	**120**	-	20	80	20	-	0	0	17	-	0	11/18